

ASCAROPHIS DISTORTUS, A NEW SPIRUROID NEMATODE
FROM A CHAETODONTID FISH IN THE
NORTHERN RED SEA

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Abstract.—*Ascarophis distortus*, the only member of its genus known from the Red Sea or a chaetodontid fish, can be characterized by the following: rounded tails in both sexes, cervical papillae present, esophagus 9-14 percent of body length, polar plugs and filaments on eggs lacking, vulva near midbody, 4 pairs of postanal papillae, ratio of right to left spicule lengths 1:5-7, and left spicule with distally attached structure. It infected *Chaetodon paucifasciatus* in the Gulf of Elat.

Members of the genus *Ascarophis* Beneden occur nearly worldwide infecting predominantly marine fishes. Presently, over 30 species are recognized; however, authorities do not agree on the definition of the genus (e.g., Polyanski, 1952; Dollfus and Campana-Rouget, 1956; Rasheed, 1965; Chabaud, 1975). These nematodes usually attach to the host's stomach wall inflicting lesions, but seldom causing disease. The species described below represents both the first member of the genus from the Red Sea and the first one from a chaetodontid fish.

Ten specimens of *Chaetodon paucifasciatus* Ahl, 101-121 mm fork length, were collected with cages in the shallow reef area of the northern Gulf of Elat. The host is the most common butterflyfish in the region and considered *C. chrysurus* Desjardins by many ichthyologists; however, we follow John E. Randall (personal communication) for our identification. Two of these harbored an undescribed species of *Ascarophis*. The nematodes were fixed in glacial acetic acid and then washed and stored in a solution of 95 parts 70% ethanol with 5 parts glycerine. After clearing the worms in lactic acid or by evaporating the alcohol from the solution, they were measured and one was later embedded in paraffin and sectioned with a microtome. Measurements are expressed in micrometers unless otherwise stated, and figures were drawn with the aid of a camera lucida.

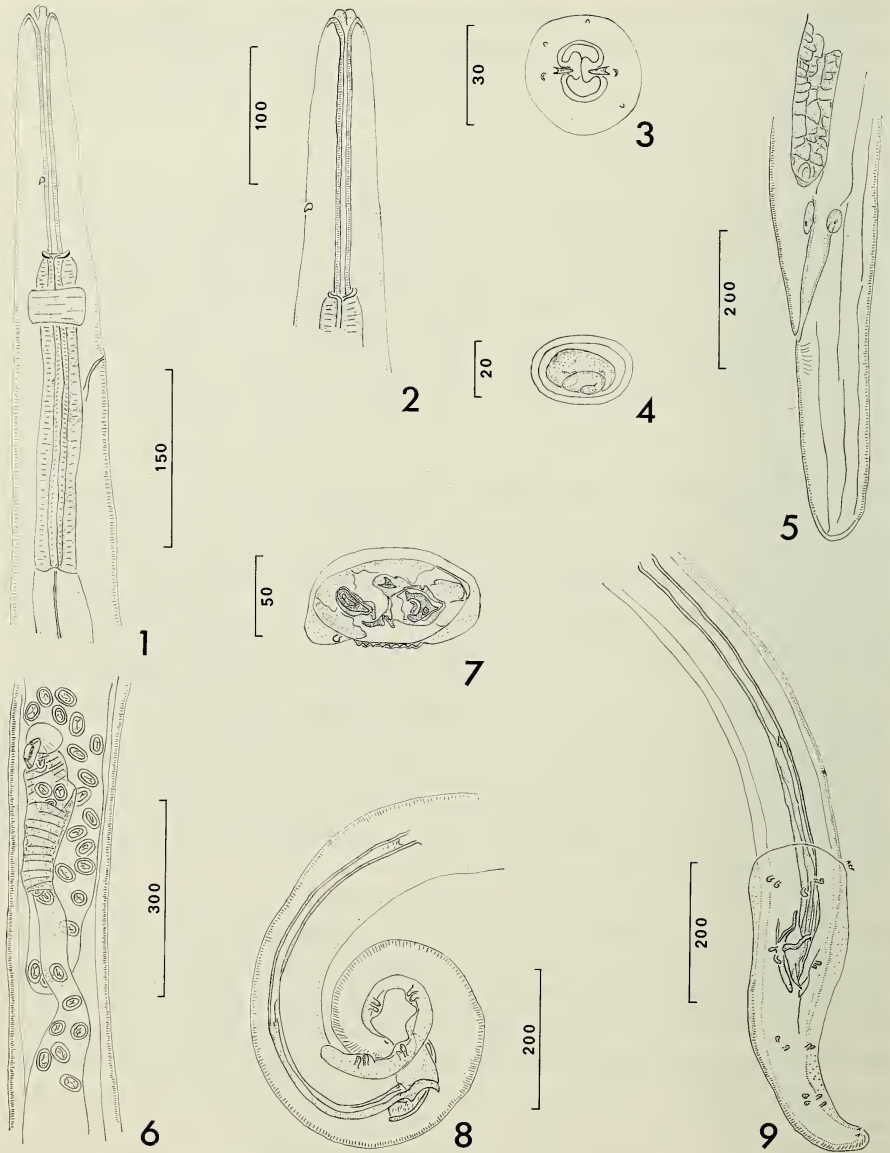
Ascarophis distortus, new species
Figs. 1-9

Description.—Body with region of greatest width anterior to midpoint. Lips 2 in number, oriented dorsoventrally. Cervical papillae rose-thorn shaped, on lateral axis. Amphids lateral, internal to ring of 4 cephalic papillae. Teeth a single pair at base of lips. Mouth dorsoventrally elongated. Cuticle with fine transverse striations near anterior extremity, with in-

tervals increasing on rest of body to maximum of 3 μm . Prostom cyathiform; vestibule having sclerotized collar at junction with short cylindrical muscular region of esophagus; glandular esophagus markedly elongate. Nerve ring near anterior of muscular esophagus. Excretory pore immediately posterior to nerve ring. Tail blunt.

Male (based on 6 mature specimens).—Body 9.5–11.4 mm long by 84–93 wide at junction of muscular and glandular portions of esophagus, increasing posteriorly to 131–145 at level of greatest width, 67–86 times longer than wide. Cervical papillae 104–148 from anterior end. Prostom 15–20 long by 20–26 at widest region. Vestibule 176–215 long (including prostom) by 6–9 wide, 1.6–1.9% of body length, 73–85% of muscular esophagus length. Esophagus 1,293–1,497 long, 12–14% of body length; muscular portion 215–267 long by 29–35 wide, comprising 16–18% of entire esophagus; glandular portion 1.07–1.23 mm long by 58–84 wide. Nerve ring 212–258 from anterior end, 29–35 in breadth. Excretory pore 238–307 from cephalic end, 29–49 posterior to nerve ring. Testis slightly sinuous, looping 2.2–2.4 mm from anterior end of body at anterior region of intestine. Spicules dissimilar; right spicule short, 92–126 long, blunt distally, heavily sclerotized; left spicule complex, 624–662 long, pointed distally, with separate projecting sclerotized portion attached to sheath in region of right spicule; spicule ratio 1:5–7, averaging 1:6.4. Caudal alae united ventrally 496–542 from posterior, supporting 8 grouped pairs of papillae; preanal papillae 4 pairs of equal length in groups of 2; postanal papillae 4 pairs of equal length in groups of 2. Longitudinal ridges occurring ventrally between alae, 5–8 in number, extending from cloaca to near level of proximal end of left spicule, short, inconspicuous in whole mounts but obvious in sectioned specimens. Phasmids paired near end of tail. Tail flexed ventrad, 265–327 long. Posterior region with 1–2 coils.

Female (based on 8 mature specimens).—Body 14.1–18.0 mm long by 90–116 wide at junction of muscular and glandular portions of esophagus, increasing posteriorly to 180–218 at level of greatest width, 74–87 times longer than wide. Cephalic papillae 104–148 from cephalic end. Prostom 20 long by 20–26 at widest region. Vestibule 162–232 long (including prostom) by 12–14 wide, 1.1–1.3% of body length, 62–82% of muscular esophagus length. Esophagus 1,328–1,828 long, 9–11% of body length; muscular portion 218–339 long by 32–44 wide, 16–18% of entire esophagus; glandular portion 1.1–1.5 mm long by 58–104 wide. Nerve ring 206–305 from cephalic end, 35–44 in breadth. Excretory pore 252–348 from anterior end, 26–43 posterior to nerve ring. Vulva situated 6.9–8.6 mm or 48–50% of body length from cephalic end. Vagina vera straight, with thick muscular wall, 90–131 long by 44–58 at widest point, extending posteriorly from vulva; vagina uterina approximately equal to or up to 3 times longer than vagina vera; uterus didelphic, amphidelphic, wide and



Figs. 1-9. *Ascarophis distortus*. Scales are in micrometers. 1. Anterior end of male, holotype, lateral view. 2. Cephalic portion of holotype, nearly dorsoventral view. 3. *En face*; the location of the 2 papillae near the dorsal-ventral plane was probably shifted about 20-30° during mounting. 4. Mature egg expelled from uterus. 5. Posterior end of allotype, lateral view. 6. Female reproductive tract showing vulva, vagina vera, vagina uterina, and amphidelphic uterus. 7. Cross section of male specimen showing caudal ventral ridges and projections off sheath of left spicule. 8. Caudal region of holotype, lateral view. 9. Caudal region of male, ventral view.

sac-like, packed with eggs; oviducts often looped; anterior oviduct 0.5–1.3 times longer than posterior one; receptacles indistinct; ovaries straight, cylindrical; posterior ovary directed anteriorly; anterior ovary directed posteriorly, approximately 0.4–1.4 times longer than posterior one. Eggs smooth, non-filamented, without polar plugs, embryonated, 32–38 long by 23–26 wide. Rectum 218–232 long with 2 rectal glands situated opposite each other at anterior of rectum. Tail 232–302 long.

Host.—*Chaetodon paucifasciatus* Ahl; butterflyfish (Chaetodontidae).

Site.—Attached to stomach wall.

Locality.—Elat, Israel.

Specimens deposited.—Holotype (male), USNM Helm. Coll. No. 73080; Allotype (female), No. 73081; Paratypes (pair) No. 73082 and (pair) Institute of Parasitology, Czechoslovak Academy of Sciences No. NP 65.

Etymology.—The Latin “distortus” refers to the distal configuration of the left spicule.

Discussion

Ascarophis remains in a confused state. Primary diagnostic generic features include the presence of two small cephalic pseudolabia each with a small tooth-like structure, a relatively long vestibule without ribs or teeth, and males with caudal alae. Even these features have not been clearly established for all species of *Ascarophis* and related genera. Filaments and plugs occur on eggs in most recognized species, but the filaments can be overlooked in densely-packed uteri or not yet developed in unembryonated eggs. As an example, they have been reported by Holloway et al. (1967) on eggs of *A. nototheniae* Johnston and Mawson, 1945b even though the filaments were originally described as not being observed. The number of postanal papillae ranges between four and ten even though Polyanski (1952) considered five as diagnostic.

Considering the lack of egg-filaments, the presence of four postanal papillae, and the presence of an equatorial vulva, *A. distortus* most resembles *A. upeneichthys* Johnston and Mawson, 1945b. That species, however, has a spicule ratio reported as 1:3 rather than 1:5–7, caudal alae more like “inflated rolls” than broad “wings,” narrower eggs, a relatively shorter vestibule, and a body half as long.

Considering other species reported without filaments on eggs, *A. girellae* (Yamaguti, 1935) Campana-Rouget, 1955 is most similar to *A. distortus* in length of body, relative length of esophagus, and vulvar position. Its spicule ratio is less (reported as 1:3.3), the eggs measure narrower (33–36 μm long by 15–16 μm wide), and the postanal papillae number ten. *Ascarophis cooperi* Johnston and Mawson, 1945a is apparently similar to *A. girellae* except it has six postanal papillae and a vulva well posterior to the midbody.

Two other species resemble *A. distortus* by having a vulva nearly equatorial and eggs without filaments, but males of those species have not been described. One, *A. helix* Cobb, 1928, differs by having a cuticle with conspicuous diagonal striations. The other, *A. gymnocranii* (Yamaguti, 1935) Campana-Rouget, 1955, is twice the length of *A. distortus*, but has a tail half as long. Additionally, the tail is pointed rather than blunt, and the eggs measure 42–45 μm long by 25–28 μm wide.

Acknowledgments

We gratefully acknowledge the space and equipment provided to the second author by Dr. Ilan Paperna of the Marine Biological Laboratory of the Hebrew University in Elat, Israel, during a study funded by the United States-Israel Binational Science Foundation, Grant No. 94. Also, we thank Roswitha Buxton for sectioning a specimen.

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